

IN THE CLAIMS:

Please amend the claims as follows:

What is claimed is:

1. (Currently Amended) A neural spike detection system, comprising:
 - (a) a signal receiver operable to receive a plurality of neural signals comprising a neural spike and wherein the signal receiver comprises a plurality of neural sensors for detecting the neural signals from neurons;
 - (b) a neural spike detector adapted to communicate with the signal receiver and detect the neural spike in the plurality of neural signals;
and
 - (c) a transmitter in communication with the neural spike detector and operable to transmit an information signal when a neural spike is detected[[.]];
 - (d) a multiplexer comprising an output and one or more inputs connected to the neural sensors for selecting a neural signal as a reference signal as the output; and
 - (e) a plurality of operational amplifiers having first and second inputs, wherein the neural sensors are connected to the first inputs of the operational amplifiers and the second inputs are connected to the output of the multiplexer for providing a difference signal between the neural signals of the neural sensors and the reference signal.

2. (Original) The system of claim 1 wherein the system is an implantable neurochip comprising very large-scale integration architecture.
3. (Original) The system of claim 1 wherein the neural spike detector comprises a remote device and communicates with the signal receiver via a wireless link.
4. (Original) The system of claim 3 wherein the wireless link comprises radio frequency telemetry.
5. (Original) The system of claim 3 wherein the wireless link comprises ultra wideband radio telemetry.
6. (Withdrawn) The system of claim 3 wherein the wireless link comprises optical telemetry.
7. (Original) The system of claim 3 wherein the remote device is adapted to be worn by a subject.
8. (Canceled)
9. (Currently Amended) The system of claim [[8]] 1 wherein the plurality of neural sensors comprise electrodes.
10. (Withdrawn) The system of claim 8 wherein the plurality of neural sensors comprise magnetic field detectors.
11. (Withdrawn) The system of claim 8 wherein the plurality of neural sensors comprise chemical sensors.
12. (Original) The system of claim 1 wherein the signal receiver comprises amplifiers operable to amplify the plurality of neural signals.

Serial No.: 10/692,235

13. (Original) The system of claim 12 further comprising a control module adapted to selectively power the amplifiers for conserving power.
14. (Original) The system of claim 12 further comprising a control module adapted to selectively control the amplification of the amplifiers.
15. (Canceled)
16. (Original) The system of claim 1 wherein the signal receiver comprises filters operable to filter predetermined frequencies in the plurality of neural signals.
17. (Original) The system of claim 16 wherein the filters are adjustable to filter different frequency ranges.
18. (Original) The system of claim 17 further comprising a control module adapted to selectively adjust the frequency ranges filtered by the filters.
19. (Original) The system of claim 16 wherein the filters are operable to filter frequencies between about 500 and about 10,000 hertz.
20. (Canceled)
21. (Currently Amended) The system of claim ~~[[20]]~~ 1 further comprising a control module adapted to selectively control the multiplexer for outputting the neural signal as the reference signal.
22. (Currently Amended) The system of claim ~~[[20]]~~ 1 further comprising one or more analog-to-digital converters connected to the operational amplifiers for converting the difference signal to a digital representation.
- 23-24. (Canceled)

25. (Currently Amended) The system of claim [[24]] 1 further comprising
~~wherein the preamplifier further includes a capacitor connected to between~~
~~the second input of the operational amplifier for reducing DC offset in the~~
neural signal.
26. (Original) The system of claim 25 wherein the capacitor and operational
amplifier are manufactured on a first and second integrated circuit,
respectively.
- 27-28. (Canceled)
29. (Original) The system of claim 1 wherein the neural spike detector includes
very large-scale integration architecture.
30. (Original) The system of claim 1 wherein the transmitter includes an
encoder for encoding the information signal.
31. (Original) The system of claim 1 wherein the information signal is a digital
signal.
32. (Original) The system of claim 1 wherein the transmitter transmits a pulse
when a neural spike is detected in one of the plurality of neural signals.
33. (Original) The system of claim 1 wherein the transmitter transmits a first and
a second pulse when a neural spike is detected on one of the plurality of
neural signals, the two pulses being time-spaced by a predetermined length
of time for indicating on which of the plurality of neural signals that the
neural spike was detected.
34. (Withdrawn) The system of claim 1 wherein the information signal is a time
multiplexed analog signal.

35. (Currently Amended) The system of claim 1 wherein the ~~neural-spike detector~~ signal receiver isolates neural spikes from noise sources by employing differential recording.
36. (Currently Amended) The system of claim 1 wherein the ~~neural-spike detector~~ signal receiver isolates neural spikes from noise sources with filtering and differential recording.
37. (Original) The system of claim 1 wherein the transmitter comprises a radio frequency transmitter.
38. (Original) The system of claim 1 wherein the transmitter comprises ultra wide band radio.
39. (Currently Amended) The system of claim 1 wherein the transmitter is implantable into a subject and further includes transcutaneous telemetry for transmitting the ~~neural-spike-detection~~ information signal outside the subject.
40. (Original) The system of claim 1 further including a controller connected to the neural spike detector and operable to output control signals in response to detected neural spikes.
41. (Original) The system of claim 40 wherein the control signals are transmitted to a mechanical device.
42. (Original) The system of claim 1 further including an indicator connected to the neural spike detector and operable to transmit a sensory signal indicating detection of a sensory input.

Serial No.: 10/692,235

- 43. (Original) The system of claim 42 wherein the sensory input is one of touch, sound, light, and chemical stimuli.
- 44. (Original) The system of claim 1 further comprising a wireless power receiver adapted to wirelessly receive power from a wireless power transmitter for powering the system.
- 45. (Original) The system of claim 44 wherein the wireless power receiver is adapted to receive a clock signal with the power from the wireless power transmitter.
- 46-82. (Canceled)